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Welcome



Nearly every digital camera now comes with the obligatory red button that activates its video mode, but how many of us actually get around to pressing it? Unlike stills photography, video can be daunting. There is a whole new set of rules, techniques to practise and editing software to get your head around. Plus, there is another dilemma: what to shoot?

Thankfully, photographers aren't starting from scratch. Many of the same principles apply to stills and video, particularly framing, exposure, composition and lighting. You can start with just the basics and introduce new techniques as you go. And as for what to shoot, well, there is plenty to choose from. If you are stuck for ideas, just turn on your TV. Wildlife documentaries are a great place to start. Watch how landscapes are shot, or how timelapse videos are used. Then think about how you can use these types of shots in your own

environment. You can even make your holiday videos more interesting so your family and friends actually want to sit down and watch them.

This supplement aims to give you some of the basic information you need to get out and start using the video mode on the camera. And if you feel inspired, why not check out The Video Mode (www.thevideomode.com), the new website from the makers of *Amateur Photographer* and *What Digital Camera*, in association with Canon. The site offers advice on shooting video, from the information you need to know when starting out, to more advanced questions on shooting raw video footage. Plus, we will be offering insights and techniques from leading videographers, as well as camera and equipment reviews. Basically, there's everything you need to get started recording video with your digital camera. So read this supplement and then pay The Video Mode a visit.

Richard Sibley, supplement editor



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Time Inc.

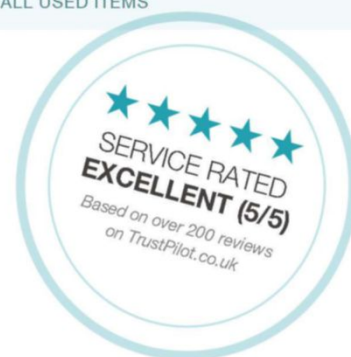
EDITORIAL TEAM

Written and edited by **Richard Sibley** Design **Mark Jacobs**
Production **Lesley Upton, Meike Abrahams**



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Shooting video

on a DSLR

Almost every camera allows you to shoot video, but the terminology can be confusing. We explain the basics, and how to set up your camera to record

FROM cine film to analogue video, the enthusiast photographer has always been able to shoot moving images. Just as with photography, digital technology has changed the way enthusiasts can shoot video. Almost every digital stills camera is now capable of shooting video, and many of these cameras can produce footage that is of broadcast quality. Computers have also had an impact, as editing software that was once the preserve of the professional can now be found on the most basic computer, or even a smartphone. On top of that, the internet, and websites like YouTube, allow us to share our video creations with the world.

Yet videography can be a daunting place. There's a new range of formats to use and acronyms to understand, as well as composition and exposure rules to learn. To help you get to grips with shooting video, or even just to refresh your knowledge if you're more experienced, we'll start with the basics.

Resolution

As technology has advanced, our ability to record and display video at higher and higher resolutions has increased. Until a few years ago, a lot of video was recorded at VGA resolution, or at



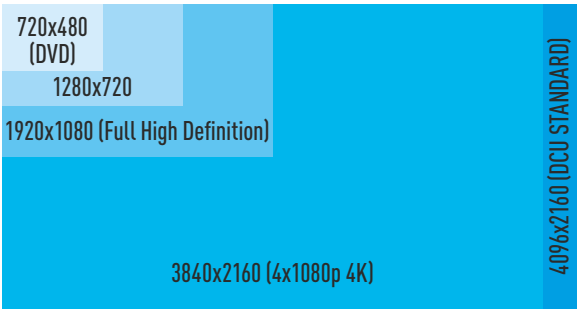
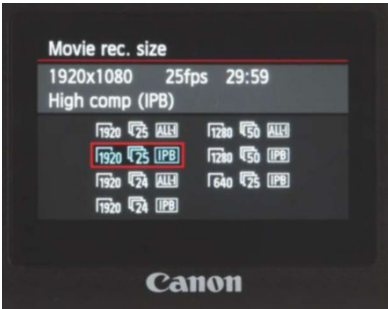


PAL, NTSC and frame rates

PAL AND NTSC are different video standards that are primarily used for analogue television broadcast, but are still relevant when shooting video. The UK, and most of the world, uses PAL, whereas the USA uses NTSC. If you're in the UK you should always set your video system to PAL, to make sure that you can play back via the camera output to a TV.

Although in these days of HD digital the choice between PAL and NTSC is less important, the one thing you still need to consider is the frame rate. The NTSC standard uses 30fps, while PAL uses 25fps. If PAL footage is shown on an NTSC standard screen, five extra frames must be added, otherwise footage will seem too fast. On the other hand, five frames must be dropped from NTSC footage when shown on a PAL screen otherwise it will seem too slow. If you plan to broadcast your video, or record it to a DVD or Blu-ray, you should make sure that it is recorded at an appropriate frame rate, and resolution, for the output medium.

On the internet things are a little different. It's possible to upload and play back footage at any number of different frame rates. However, 24, 25 and 30fps are the most common speeds, and online video players mostly support these. However, it's worth noting that some sites may recompress the video, causing a drop in frame rate or a loss in quality.



640x480 pixels. For comparison, broadcast quality NTSC SD resolution is recorded at 720x480 pixels, while PAL SD resolution is at 720x576. The introduction of high-definition television brought us 1280x720 and 1920x1080 pixels.

4K video is now becoming more common, despite the fact that most people don't have a TV or monitor that's able to display the footage. There

are a few variants in 4K resolution, but it's generally recorded at 4096x2160 pixels – meaning that a still frame from a 4K video is around 8 million pixels in size. Believe it or not, 8K is expected to arrive by the end of the decade, at an incredible 7680x4320 pixels or 33.2 million pixels for a still frame.

So which resolution should you choose? Generally, you should always chose the highest resolution you can – even if you're only uploading your

Above left: Set your camera to record video at 1920x1080 pixels at a rate of 25fps

Above: As this illustration shows, the difference in resolution from high definition to 4K is a big increase

footage to YouTube or a similar site. If you watch 640x480 footage from 10 years ago on a 50in high-definition screen today, it will look very low quality. Try to shoot in 4K, because even if you don't fully appreciate it now, you probably will in the very near future.

Video files and formats

First, you'll need to get to grips with the various kinds of video formats available. This is a dazzling world of names and acronyms like AVCHD, H.264, MPEG-4 AVC, QuickTime, AVI, MP4, Pro Res and X AVC. However, once you know how video files work, it's actually fairly straightforward and there are really only a few you need to concern yourself with when starting out.

A video file is made of two parts: a container (or wrapper) and a codec (or compressor). The most basic way of understanding how they work is to think of the container as a library or filing



system. It contains all the information and instructions that allow the video clip to be played properly.

Within the container is the video, and audio, itself. In the same way that there are different image file formats, such as JPEG, TIFF and BMP, there are different video formats. Each of these can be compressed in different ways. Some are compressed to get a small file size, at the expense of image quality, while others are designed to produce the best image quality possible – although this often creates large files in the process. The codec is the form of compression that has been used for the video, and for the audio.

When you play the video back, the container instructs the software, or hardware, how to play the video, audio and even subtitles that are contained within it. Thankfully, most computer media players can now play almost any video file, but on the internet things

work differently. Also bear in mind that if you want to create a DVD or Blu-ray, you also need to stick to specific standards for video creation, although much of this can be done after editing your video.

For most purposes you'll want to record as an MP4 file. An MP4 file is actually a container file that contains MPEG-4 Part 10 AVC video. Confusingly, MPEG-4 Part 10 AVC is much more commonly known as H.264. So an MP4 file can have H.264 compression. However, AVCHD files also use video that has H.264 compression.

Some cameras will offer a choice of different file formats, perhaps MP4 or AVCHD, and it may be confusing when it comes to deciding which one to use. When you're starting out, it may help to know that MP4 files are slightly easier to work with, as the AVCHD container uses a folder structure that can seem

confusing. MP4 files are simpler to use, as they can be opened and played just like a conventional file. They are also much easier to upload to the internet.

Interlaced or progressive?

You'll often see the letters 'i' or 'p' after the video resolution, such as 720p or 1080i, and you might also see it after the frame rate, such as 24p, 30i or 60p. The letters refer to the terms 'interlaced' or 'progressive'.

Progressive footage means that the video is played back line by line, so lines 1, 2, 3, 4 and so on will be played back consecutively. Once the last line has been played, it returns to the first line and the process starts again.

Interlaced footage plays alternate lines from the video (for example, 1, 3, 5, 7) and once it has played the last line, it will return and play the remaining ones (2, 4, 6, 8 and so on).

A lot of the debate over progressive or interlaced stems back to the original technology and techniques used for broadcast. Nowadays, with some consumer cameras capable of recording at 60p, and sensor readout speeds getting faster and faster, the case for shooting interlaced footage is becoming less relevant. We would recommend shooting progressive footage, but try both on different types of subjects and see which one you prefer.

Colour

Although there are some cameras that now shoot a raw video format, for the most part you'll be working with compressed footage. To get the most out of editing this footage it's important to make sure that it's as 'flat' as possible. This means preserving as much detail in the highlights and shadows as you can, which in turn means shooting the footage with the lowest contrast colour setting available and with colours that aren't overly saturated. Look for a colour setting in-camera that is specifically for video, or for a Faithful, Natural, Neutral or a flat (low contrast and saturation) setting. Even in these settings, it can be worth reducing the saturation and contrast further, and then editing the colour in post-production.



Select a colour style in-camera that is low contrast and low saturation to capture as much detail as possible



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AFOY

Amateur Filmmaker of the Year competition

Your chance to enter the UK's newest competition for budding amateur filmmakers

TO COINCIDE with the launch of The Video Mode website, we're pleased to announce our new Amateur Filmmaker of the Year (AFOY) competition. AFOY challenges you to get creative with your filmmaking, and gives you the opportunity to win some fantastic prizes worth £10,000 in total.

The competition is split into three rounds, each with its unique theme: Nature, Time and Love. To enter, submit a video no more than five minutes in length, of HD quality. You can shoot on any camera you'd like, and the content and editing are up to your imagination – so long as it fits

the round's particular theme.

Visit www.thevideomode.com to view the top videos, as well as the scores and a leaderboard for the overall competition. The winner will be the person with most points after three rounds, who will win the overall prize as well as title of Amateur Filmmaker of the Year.

Round One: Nature

In this round we ask you to film nature from a new perspective. Look at the world around you – from urban foxes at twilight, to a spectacular sunrise – from a new angle and get creative with unique viewpoints. To see examples, go to www.thevideomode.com/examples.

Rounds and dates

Below is a list of the competition rounds, their themes and the dates you need to know. To view the results, visit www.thevideomode.com. When planning your entry, take into consideration the criteria of fulfilling the brief, creativity and technical excellence on which you'll be judged.

Theme	Opens	Closes
Round One: Nature	1 Aug	30 Sep
Round Two: Time	1 Oct	31 Dec
Round Three: Love	1 Jan	28 Feb

The overall winner will be announced in April 2016

Prizes

Enter to win your share of prizes worth over £10 000! Here's what you could receive:

Round One

Canon EOS 7D Mark II, worth £1,499.99

Canon Legria Mini X, worth £329.99

Round Two

Canon EOS 5D Mark III, worth £2,499.99

Canon Legria Mini X, worth £329.99

Round Three

Canon XC10 (with 128GB CFast card and reader), worth £1,999.99

Canon Legria Mini X, worth £329.99

Overall prize

Canon Cinema EOS C100 Mark II, worth £3,599.99

Visit www.thevideomode.com/afoy

to send us a link to your short film and to view the full terms and conditions

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To go along with the launch of the first round of the Amateur Filmmaker of The Year competition, we're holding an exclusive seminar in London for all budding filmmakers

FREE EVENT!
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THIS tutorial session is essential for amateurs who would like to learn the basics of filmmaking with a DSLR or compact system camera, and will cover everything you need to know to get more out of that red record button.

Expert videographer Simeon Quarrie will provide you with the technical and practical skills needed to start shooting high-quality video, including:

- **Setting up your camera for optimum results**
- **Essential shooting skills**
- **The importance of high-quality audio**

Lunch will be provided and, as an added bonus, you'll have the chance to get hands on with the latest Canon equipment.

PLUS 10 lucky attendees could also win an exclusive practical

afternoon session, to put their new-found skills into practice.

To secure your place on this not-to-be-missed learning opportunity, please email afoyevent@timeinc.com with the subject line, 'Canon Video Event'. Also include your full name, address and contact number, and if you'd like to be considered for a place in the afternoon hands-on session.

Your expert guide



Simeon Quarrie is known for his creativity and storytelling in both video and photography.

His work has seen him travel across the world for clients who seek his unique approach. With his passion for both wedding photography and cinematography, Simeon has successfully worked across a range of genres. He is a prolific educator with infectious enthusiasm and his work features on top industry blogs.

Places are on a first come, first served basis and are limited to 90 people

How to expose fo

Exposing for video is very similar to exposing for still images. However, there are key rules you need to know

IF YOU know how to expose a still photograph, then you know how to expose video. There is one important rule, the 180° shutter rule (see right), but the basics of aperture, shutter and sensitivity remain the same.

Depending on the camera you're using, you may have the option to shoot as good straight out of the camera as you can, and this means avoiding blown-out highlight areas.

Sensitivity

Just as with stills photography, the higher the sensitivity, the less light is required to expose the frame. However, due to the shutter speeds that are used for video, the sensitivity will generally be at the lowest possible settings, usually ISO 100, 200 or 400, depending on the camera.

Using a higher sensitivity can also introduce noise. On a still image noise is acceptable to some degree, but the random nature of video noise means that shadow areas are prone to constantly looking fuzzy and may even change 24 times a second, which can be very distracting. Again, it's best to stick to lower sensitivity settings to try to prevent this.

Shutter speed

Stills photographers will know that the shutter speed is used to control how movement is recorded in a scene. So if you're taking a picture of running water, for example, a slower shutter speed will give you blurred or smooth water, whereas a fast shutter speed will 'freeze' the water in place as it falls or flows.

In digital video, however, the shutter works slightly differently. For a start, with stills photography you're relying on a mechanical shutter, but when you're recording video the noise of the shutter would be picked up during video recording. So instead, the shutter opens at the start and then an electronic shutter simulates the function of the mechanical shutter as you film.

When shooting stills, you can shoot at any shutter speed you like, or at least whatever shutter speed is appropriate for the effect you're aiming for and the environment you're working in. You can capture images right up to 1/8,000sec (so long as your camera has that function), right down to long exposures lasting a number of seconds.

So the critical difference between the two disciplines lies in the fact that for video you're limited

to a single shutter speed while recording – and that shutter speed depends on the frame rate you're shooting at.

Aperture

The aperture setting controls the depth of field, as well as the amount of light coming into the camera through the lens. The restrictions on what shutter speed can be used for video has a big impact on the aperture settings that can be used. In video, a shallow depth of field is often used to isolate the subject. One of the advantages of shooting with a DSLR that has a large sensor is that consumers can reproduce this look – and therefore a video that looks like a Hollywood film. In the past, video cameras with smaller sensors couldn't replicate this shallow depth of field, which is why most amateur videos have front-to-back focus. To give your video a cinematic effect, try using a shallow depth of field and carefully focusing. Don't use it all the time, though, as it may look amateurish.

ND filters

Having to stick with a fixed shutter speed can feel particularly limiting for those of us who are experienced in stills photography. If you're outdoors and shooting at 1/50sec at your lowest ISO and you want to use a wide aperture, you'll often find that your scene is overexposed. The natural tendency for a photographer would be to increase the shutter speed, but because we can't do that on video we have to use ND filters to reduce the amount of light entering through the lens.

When shooting video, ND filters work in exactly the same way as they do for

ND filters reduce the amount of light entering the lens, and prevent a video becoming overexposed



Master video

images. ND filters come in different strengths and can cut out a number of stops of light starting at 1 stop and going right up to 10 stops. You can also combine filters to block out even more light if, for some reason, 10 stops isn't enough.

However, one ND filter that's become popular over recent years is the variable ND filter, which is a circular filter that can be adjusted between 2 and 10 stops. The advantage of this is that one filter gives you 8 different stops of light, which also means that it's possible to subtly adjust the exposure while filming. However, not all variable filters are born equal, and some are a lot better than others. It is worth getting a good-quality variable ND filter from a reputable manufacturer and supplier, as cheaper versions can cause colour casts or strange light patterns to occur.

This is an aspect of videography that you would particularly like to control, as some professional video cameras – like Canon Cinema EOS models – have a variable ND filter built in so that a range of stops can be dialled in without having to attach a filter to the front.

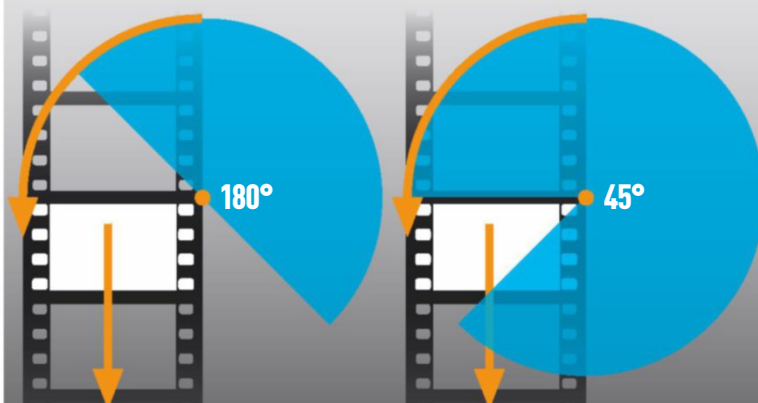
Zebra patterning

ONE FEATURE that has found its way from professional video cameras to digital cameras that also shoot



video is zebra patterning. The moving black & white striped pattern can be seen in areas of the image that are blown out. Usually the zebra pattern can be set to a specific value. If you only want to see areas that are completely white, with no detail, then set the

zebra pattern to 100%. However, to make sure there is enough detail for editing, and that no area is white, even if seen on a variety of different screens, it may be worth setting the zebra lower, to, say, 95%. This will then warn you of any area that is over 95% in brightness. The zebra patterning and histogram should be your guides when it comes to setting exposure.



The 180° shutter rule

THE 180° shutter rule relates to the fact that film cameras use rotary shutters, and by changing the angle of the rotary shutter you can change the duration of the exposure (see https://en.wikipedia.org/wiki/Rotary_disc_shutter for details).

For a natural-looking motion, the shutter speed should be twice the length of the shooting rate. So at 24fps or 25fps, the shutter should be set to around 1/50sec. If you're shooting at 30fps, then the shutter speed can be set to 1/60sec. If the shutter speed that is exactly double isn't available, then choose one that is closest. For example, if shooting at 60fps, the shutter speed can be set to 1/125 sec.

If you shoot slower than the 180° shutter rule, then the footage will

suffer from motion blur, which can look odd and cause a loss in detail. Conversely, shooting at a faster shutter speed (and therefore a smaller shutter angle) can create a stuttering type of motion, and make natural human movements look slightly robotic.

Over the years filmmakers have put both these effects to good use – for example, a 45° shutter was used for some scenes in the TV series *Band of Brothers* and the film *Saving Private Ryan*. This would have meant shooting at a shutter speed of 1/198sec, or 1/200sec on a digital camera, and was used to create a very tense, uneasy feel reminiscent of the slightly staccato look of old cine films. Sticking to the 180° shutter rule will give you the most natural movement.

Want to shoot better **Video**?

Well now you can! **The Video Mode** is a brand new website from **Amateur Photographer** that will teach you everything you need to know, from capturing those special holiday memories to filming the next blockbuster.



THE **VIDEO**MODE In association with **Canon**

The Video Mode features tuition videos and technique articles from expert filmmakers designed to help you capture professional quality movies.

www.thevideomode.com



FROM **Amateur
Photographer**

Sound recording

Great picture quality is only half the story when making videos, as the sound is just as important. Here's our guide to the basics of audio recording for videographers

BUILT-IN microphones fitted to DSLRs and compact system cameras are fine for short personal clips of your holidays or the kids playing in the garden – subjects where the camera operator is also likely to be the narrator – but for anything more professional, the quality is woefully inadequate. Good sound quality is just as important as good picture quality. You can disguise less than perfect pictures with great sound, but great images will be ruined by poor audio.

For anyone looking to take video seriously, the first investment, after the camera itself, should be a microphone, and if you're buying a camera with video in mind you should make sure it has an input to accept a mic. Over the next few pages we look at the factors to consider when recording audio on your camera, and the options available to help you get the best results. Our assumption is that you'll want to record a human voice in your videos, but even if you only wish to record, say, birdsong, the same principles still apply.

Hotshoe mic

A mic can often be attached to your camera's hotshoe. Although this is convenient, it may not always be the best place to put it.

Mic input

Unless you're using a separate digital audio recorder, you'll need a camera with a mic input to achieve good-quality audio with your video.

Headphone output

It's important to be able to monitor the quality of the sound you're recording, so a headphone port is a desirable feature.



Built-in mic

A built-in mic is a poor choice for recording sound. For a start, it's very small – so small that you may not even have noticed where it is (look for a cluster of tiny holes on the front of the body). It's omnidirectional, so it picks up sound from all around. While it may not be powerful enough to clearly pick out the voice of a subject speaking a few metres away, it's sensitive enough to amplify the sounds in its immediate vicinity, including your breathing and even the quiet whirring of the lens's AF motor. It's vulnerable to wind noise, too, which records as a loud roar and drowns out any speech.

These shortcomings can all be cured by using a suitable external microphone. But which type should you choose? There are so many, each of which has its place, depending on your needs. Let's take a closer look at the options.

Directional hotshoe mic

Many camera brands and independent companies make a simple cardioid microphone that fits into your camera's hotshoe, plugs into the mic input and records the sound coming from in front of it. You can buy these for less than £100, and they offer stronger sound and less distracting background, handling and wind noise (when used with a suitable windshield). However, they still have drawbacks. For the best audio quality, the mic should be as close as possible to the sound source, not on the camera. If your subject is over two metres away, the quality will suffer. To see how much difference a hotshoe-mounted mic can make, see our video at www.thevideomode.com/tuition/the-basics-of-recording-audio-for-video-323.

The shotgun mic

The shotgun mic can also be mounted on your hotshoe, using a suitable shock-absorbing cradle, but it's much more

What we use

Although we use a variety of cameras (mostly Canon DSLRs or the Panasonic Lumix DMC-GH3), our audio recording kit is fairly consistent. We use:

A Sennheiser EW 100-ENG G3 (around £720)

Probably 90% of our videos are shot using this wireless lapel mic, attached to the presenter. We have two sets, one using XLR connections for our audio recorder, and the other fitted with 3.5mm mini-jacks so it can go directly into the camera.

A Sennheiser MKE 600 shotgun mic (around £260)

For those occasions where a lapel mic isn't suitable, we use this excellent shotgun mic, both on and off the camera, depending on the situation. **Rycote accessories** To combat wind noise, our mics are fitted with Rycote windshield accessories, including the Softie Windshield Kit for our shotgun mic. We also use Rycote's shock mounts, whether handholding or hotshoe-mounting the mic.

A Tascam DR-40 This particular digital audio recorder can accept both XLR or 3.5mm mini-jacks, making it a versatile recorder whichever mic we're using.

For tutorial videos showing how to film better videos on your DSLR, see our website at www.thevideomode.com

THE VIDEO MODE

directional – you could say it's the telephoto lens of microphones, in that it picks up from a very narrow angle in front and has a longer range than a basic hotshoe mic. Even so, shotgun mics are most frequently used off the camera, suspended from a boom above the subject, or pointing up from below, out of camera shot. You've probably seen them in behind-the-scenes shots of movie and TV sets. Shotgun mics are usually more expensive than basic on-camera hotshoe mics, but they have the benefit of being more versatile.

The lavalier mic

The lav mic, or lapel mic, is a tiny

Above: The Tascam Dr-4 (£160) is a versatile portable digital recorder that accepts different types of mini-jacks

Below: The Sennheiser MKE 600 Shotgun mic (£260) works well for occasions when lapel mics aren't suitable



microphone that attaches to the clothing, just below the neck, of speaking. Its short range up crystal-clear sound from the person it's attached to, while ignoring more distant sounds. These mics are available in both omnidirectional and directional types, and both wired or wireless varieties. Although you can pick up a wired lav mic for under £50, your shooting distance is limited by the length of the cable (on average, about 6m) since the other end of the mic cable plugs directly into the camera. (There is a workaround for this, however, which we'll come to shortly.) With a wireless lav mic you can shoot from further away and the subject has complete freedom of movement. The downside of lav mics is that they're visible in your video, and the wireless varieties can be very expensive for the amateur filmmaker.

Using a separate audio recorder

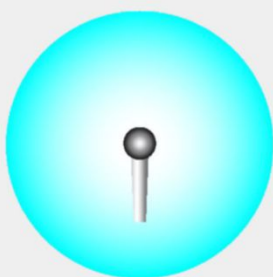
So far, all the solutions presented assume that you're still recording your sound in-camera, but this doesn't have to be the case. In fact, there are many reasons not to. The most obvious is that you may not even have an external mic input to plug a microphone into. Even if you do, the main problem then becomes how you control and monitor the sound. Few cameras currently have manual audio-level adjustment, and if they don't, it means they'll use auto gain compensation to automatically adjust the record level (like auto exposure, but for sound). This means that if the ambient noise level in your environment suddenly drops (for example, if someone stops speaking or music stops playing) the camera,



Microphone types

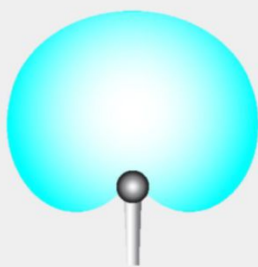
Omnidirectional

Lavalier mics (also known as a lav, lapel or clip mic) use this 360° polar pattern and can easily be placed on a presenter or interviewee. You can hear someone standing next to the speaker, as well as noise from the side, behind and below.



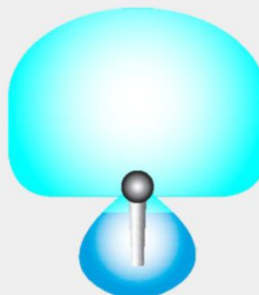
Cardioid

A cardioid microphone has the most sensitivity at the front and is least sensitive at the back. Cardioid microphones have more of a 300° polar pattern, which is useful for capturing audio from the front and sides of the microphone.



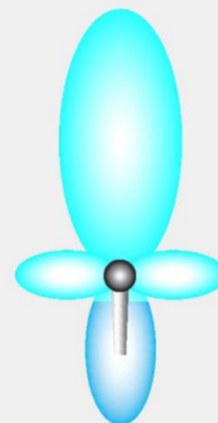
Supercardioid

These offer a narrower pick-up than cardioids and a greater rejection of ambient sound. They also have some pick-up directly at the rear, making it useful for interviews, as it saves time turning the microphone around every time a question is asked.



Lobar

Found in shotgun mics, the polar pattern has the highest possible directivity, so you can focus in on a specific area, as well as getting some pick-up from behind.



Microphone coverage a

suddenly unable to hear anything, starts to panic and cranks up the record level, delivering a sudden whoosh of background hiss. Then, when the sound starts again, the level drops suddenly and obviously. It sounds pretty amateurish. If your camera does have the means to set a record level, with a meter to provide a visual representation of the audio being recorded, you should use it, setting the peaks of your sound to hit the -12dB level to avoid distortion. Even then, there's no substitute for actually hearing the audio that you're recording so you should ideally be monitoring it through headphones. If your camera has a headphone output, make sure you use it.

So let's say that your camera does have manual audio-level control and headphone monitoring – you're good to go, right? Well, yes and no. An audio recorder will still deliver much better sound because it uses better quality, more powerful pre-amplifiers, and less compression. It's a device purpose-built for the job. By not being attached to the camera, it also enables you to get your wired microphone much closer to the sound source (the holy grail for good-quality audio). It's no longer an issue that your

6m wired lav mic won't stretch to the camera, for example. The audio recorder can be hidden near the subject, just out of camera shot.

The Azden SMX-10 Directional Stereo Microphone (£100) makes use of a 'lobar' polar pattern



ALL PRICES ARE APPROXIMATE STREET PRICES

Can't afford an audio recorder?

You can buy a reasonable digital audio recorder for under £100, and an excellent one for not a lot more, but if you're on a tight budget you could also consider the audio recorder you already own – your smartphone. All iPhones and most other devices have a built-in audio recorder that is superior to the one in the camera, and like digital audio recorders they have the benefit of being able to be positioned close to the subject. Use one on a table in front of your speaker, or even slipped discreetly into the shirt pocket (the mic is generally at the bottom of the phone so it will need to be upside down) or plug in a compatible mic (look for one with a TRRS jack). An inexpensive lav mic clipped to the speaker's lapel and plugged into a iPhone in their back pocket will produce much clearer recording than the camera will.

In addition to the built-in audio-recording apps that come with your

phone, there are dozens of others, like Griffin's iTalk, with more functionality.

The downside of audio recorders

Using an audio recorder obviously adds a little more hassle to your shoots. It's another thing to think about, something else to go wrong and something else to have to buy, but then 'best' and 'easiest' rarely coincide in life. The biggest hassle, though, is the fact that you'll have to synchronise the sound you have recorded separately with the picture you have recorded in your camera later.

Thankfully, this is pretty easy. By making a couple of loud claps with your hands (a free alternative to using a clapperboard), you can line up the peaks in the visual waveform that this creates with the same peaks on the audio that is recorded automatically by your camera. Once synchronised, you can then remove the in-camera audio track. It takes just a couple of minutes.

A video-capable DSLR, microphone and a tripod are all you need to get started



21 top tips for shooting video

There's a lot to learn, but our round up of the best advice will help you shoot successful videos

1 Know your camera

Before you even step out of the door, you should have your camera set up. When you are out filming, the last thing you want is to be searching through the menu trying to find something or having to change a setting. Spending some time learning how your camera works, and how to get the best footage from it, will ensure that you come home with the quality footage you are after.

2 Power and space

Recording video will eat through your batteries, so make sure you are carrying at least one spare. It is worth testing your camera before you leave so you know how long you can record before the battery dies. Also, turn your camera off when it isn't in use – recording and keeping the screen

Make a shot list before you set off and don't forget the memory cards and spare batteries



powered will cause the battery to drain. Switch the camera off completely if you aren't recording to help preserve the battery life.

Similarly, high-definition video can take up a lot of storage space. The latest 4K video footage requires fast cards, so look for those with a UHS-III (U3) rating, which should be capable of capturing this footage. For standard 1080p footage, UHS-I (U1) cards will suffice. Always take a back-up card with you as you may end up shooting more than you thought. Some cameras give an indication of how many minutes of video can be captured with the remaining space on the card.

3 Shoot what you enjoy

A lot of photographers have the desire to shoot video, but simply don't know what to shoot. They think that everything must be a fictional narrative story, but in truth videography can be whatever interests you, and an obvious place to start is with whatever you take photographs of. If you like wildlife photography, try shooting a wildlife video. If you like travel photography, make a short video of the places you are travelling to. Remember that what enthuses you is bound to interest other people, so don't be scared – just go out and shoot what you are familiar with.

4 Tell a story

Before you even start a project, think about the story that you want to tell. A good story should have a very clear beginning, middle and end. Make sure you know the story you want to tell and think about the shots you will need to illustrate this.

Your story could be a 'day in the life' tale of a person or an animal. Think



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about how the day starts and ends. Alternatively, it could be a story of how a bird feeds its young. What is the start, middle and end to this story, and what shots would you take?

5 Make a shot list

Once you have your story, think about all the shots you'll need to tell it. Consider the main scenes and, if possible, add some of the close-ups and B-roll (see tip 7) that you will need. Having a list may seem old-fashioned, but it ensures that absolutely nothing you need is missed.

6 Establish the scene

Establishing shots form the footage that tell the viewer key information about the scene and location. They help to establish where the action is taking place. For a wildlife film this could be some wideangle footage of a field as the sun comes up. After this establishing shot, the viewer then knows where any

following footage has taken place and what time of day it is.

7 Take plenty of B-roll

In film terms, B-roll is the extra footage that helps to add detail and character to a film. For example, if you are filming the groom writing his speech before a wedding, film an establishing shot of the groom in a room, get some closer footage over the groom's shoulder of him writing away and then try getting some B-roll footage that you can cut in. This could be a close-up shot of the pen on the paper, the groom's eyes as they scan what he has written or some scrunched-up rolls of paper where he has discarded previous attempts. All this footage adds character and detail that makes it more interesting than just a close-up shot of the groom writing his speech.

Shoot whatever interests you – if you like wildlife photography, make a wildlife video

8 Don't just shoot the obvious

Just as with stills photography, think about how you can use angles creatively to make your footage more interesting. While it is fine to take establishing shots from eye-level, try to get additional footage from higher or lower. You may not end up using all this footage, but if you don't shoot it, the moment may be gone and you may not get another chance. Look for alternative angles and options, particularly for your B-roll, so you have plenty of options to make the edit more interesting.

9 Keep it to 10 seconds

This isn't a hard-and-fast rule, but try not to have any single clip last longer than 10 seconds. Of course, you can do this when editing, but try to think about how you can shoot plenty of interesting clips that are all shorter than 10 seconds and assemble them together. You may only use a couple of seconds out of the 10, but chances are there will be few times you will want your clip longer than 10 seconds.

Don't just hit record and film away. Shoot a 10-second wideangle establishing shot, a 10-second standard-length shot and numerous 10-second close-ups as your B-roll. You will then have a far more interesting 30 seconds than if you had been continuously recording and zooming in.

10 Less is more

Just because you can do something, it doesn't mean that you should. It is easy to get carried away with lots of panning shots, or zooming all the time, but this can make your footage look amateurish. Keep your use of these effects to a minimum.





Left: Use on-screen magnification to check focus

then it may be worth making a mark on the tripod head to note where the pan should start and stop. A chinagraph, chalk pencil or some stickers can often be useful for this.

16 Think about light

Just as you would with still images, think about how your scene is lit. Use a fill-in light where you need to and avoid shooting your subject with their back to the sun.

11 Keep it steady

No one wants to look at shaky footage, so make sure you have some kind of image stabilisation switched on in-camera or on the lens. Ideally, you should be using a tripod or other support. See pages 20–21 for various devices currently available.

12 Manually focus

As intelligent as camera autofocus systems are, using them for video will generally lead to the camera hunting back and forth during filming. Switch your camera to manual focus and, as a rule, lock the focus at the beginning of the recording. Moving the focus during recording is known as focus pulling and is a real skill. There are devices called focus pullers that make it far easier, as they allow you to mark two points of focus on a lens and then shift between them. So if you want to switch between one subject talking to another halfway through recording, make sure you know the exact two points of focus so you can move between them before you start recording. It can be very difficult to make these switches of focus smooth, which is why a focus puller is used, and why professional video lenses have very large focus rings.

13 Check your focus

Always double-check focus. It is the most common mistake to make when you are starting out, and nothing can correct it once it has been shot.

14 Use an elastic band

One of the most useful things that can help your panning shots is a simple elastic band. If you have a panning head that doesn't pan particularly smoothly, tie an elastic band to the panning handle and pull on it. The band should create a nice even tension that will make the movement very smooth, even on an inexpensive head that doesn't offer variable resistance.

Right: A focus puller can help when manually focusing

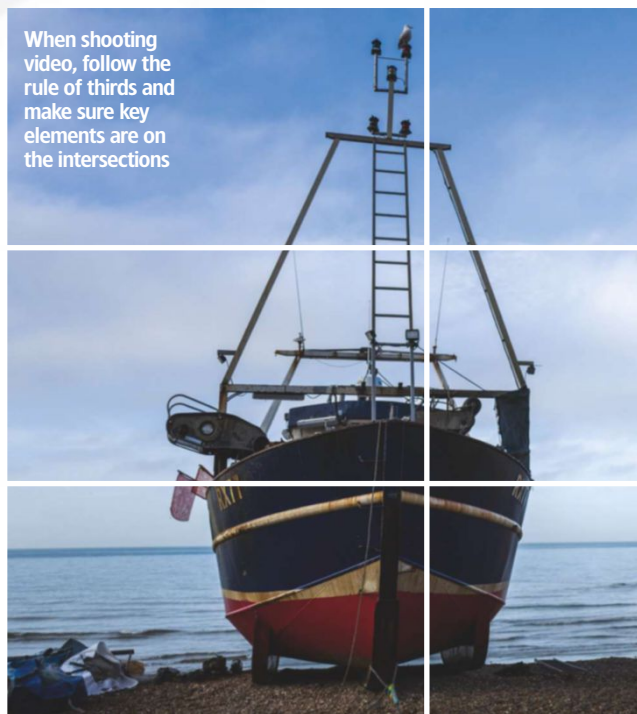


15 Compose video as you would a still image

Although you are dealing with moving footage, the principles of composition are the same for both stills and video. Remember the rule of thirds and make sure key elements are on the third intersections. Also look for leading lines to help balance images and lead the eye across the frame to the principal subject.

If the subject of your images is moving across the frame, think about where they are starting and also where they will finish. If possible, make a mark on the floor or note a point in the landscape that will help them know where to stop, or help you to decide where to stop filming or panning. Again, if you have the chance to practice this,

When shooting video, follow the rule of thirds and make sure key elements are on the intersections



17 Practise with still images

If you haven't got much in the way of video footage, then a good place to start learning the skills you need when structuring a story and editing your work is by using still images.

Think about how you want your story to start and how you want it to end. What details do you want to show? Think about how to show your images in an order to make the story interesting. Most editing software will allow images to pan across, so you can see how these visual effects will work. You can also practise the timing of cuts to music or audio, and how to place transitions. Travel images are often a good option to practise with, as you will naturally have a narrative of the trip and hopefully plenty of variety.

18 Enjoy editing

If you don't enjoy editing your video this will show in the editing process. So if you are feeling tired of editing or are having a bad day, get away from the computer and give yourself a break. Being stuck in front

Edit your video on a separate hard disk drive, such as this G-Drive



Try using still images to practise your video skills



of a computer screen for hours at a time isn't much fun and can make you a little blind to what you have already done. Take a break and revisit your work later. Looking at an edit with a fresh pair of eyes can help you when you refine and tweak it.

19 Edit a rough version quickly

Once you have all your footage, don't start the full editing process straight away. Get the essential video clips on the timeline and edit them together. Make a very rough cut of the essentials, and when you have that in place start to fine-tune by adding more B-roll footage, refining the cuts and adding transitions.

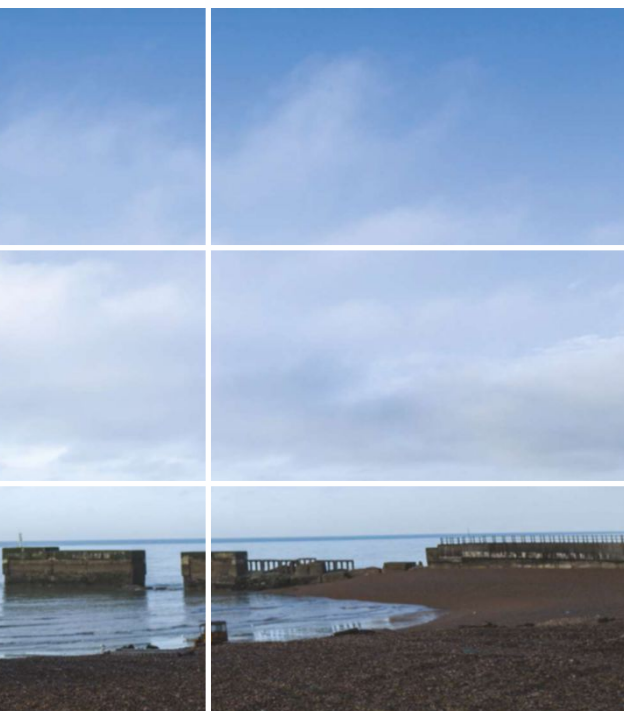
20 Keep your video on a separate hard disk

It is best to edit your video on an external hard disk drive, connected via a fast USB 3.0 or Thunderbolt connection. As the computer's internal disk is also used to run the software and operating system, having it spin back and forth looking for video footage will slow things down. So long as you are using a fast external hard disk and connection, an editing video stored on an external disk will be far quicker.

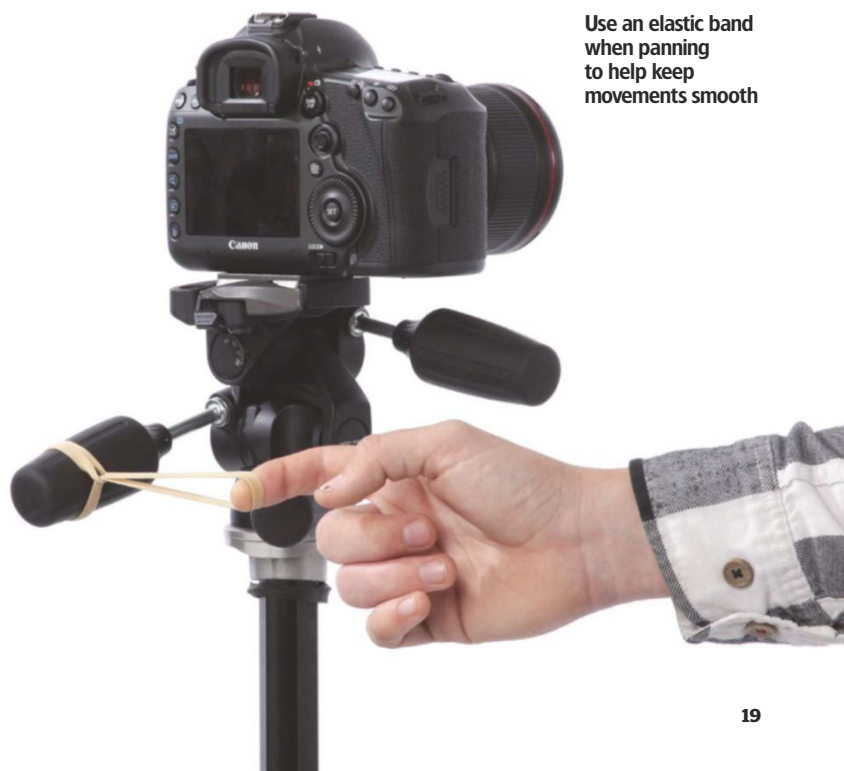
21 Back up, back up...

Just as with still photos, if your hard disk dies you could lose everything so make sure that your videos are saved to at least two places.

'If you haven't got much in the way of video footage, then a good place to start learning the skills you need is by using still images'



Use an elastic band when panning to help keep movements smooth



Supporting your camera

Just as with stills photography, for high-quality images you need to keep your camera as stable as possible. There are many ways to do this, depending on what you're shooting. We look at some here

WHEN filming on a DSLR, one of the most important skills you have to learn is how to keep your camera steady. With stills images a tripod or monopod is the obvious choice, and these supports also work with video cameras, but what do you do if you want moving footage? How do you keep your camera tracking or panning while ensuring the footage looks smooth? There are many tips, tricks and techniques for this and, in fact, there's a whole industry based around supporting your camera.

Tripods

If you're just starting out, try using a standard camera tripod. Remember that when you're shooting video, you should apply the same principles as you would if you were shooting a long-exposure image. To keep the footage completely steady and free from any shake, you need a sturdy tripod that has good locks. It also needs to be placed on solid ground and it's important not to walk around the tripod, as it may cause it to move slightly.

After a while you may find that you want more support than a standard photographic tripod can offer. Tripods designed for video usually have far wider legs that are less prone to wobble and won't rock in the wind. They're also generally larger, with bigger heads and no centre column. These features help to keep the camera as steady as possible and reduce vibrations when recording.

Monopods

Monopods are lightweight and easy to use, and are just as popular for videographers as they are for photographers, particularly when combined with in-camera image stabilisation. Monopods can be used in the same way as they would for still images, and provide a single leg that can be useful when shooting subjects like wildlife, where you may have to quickly reposition your camera.

However, the humble monopod has a second use, which is to act as a stabilisation device when moving with the camera. Attaching a monopod to a camera, and keeping it collapsed, adds extra weight to your DSLR, which can help keep movement smooth. Securing the monopod against your waist or into your belt can also help keep moving footage smooth, as it provides another anchor point.

Stabilising devices, rigs and cages

There are a huge number of devices that are designed to stabilise a camera when you're shooting moving video. The most basic of these is a simple shoulder support, or shoulder rig, which uses the natural weight support of the shoulder to help prevent shake and provide more fluid movement.

Counterweighted stabilisation devices are another alternative, and these include Steadicam products. These screw into the tripod socket on the bottom of the camera, and use a weight

to provide ballast that counteracts and softens any movement. When used by a skilled operator, footage shot using a Steadicam can look as though it was shot on a camera on a dolly (a type of support on wheels), but the advantage of a Steadicam, or a counterweighted support, is that it can go where a dolly can't, such as up and down stairs.

For the average enthusiast, a counterweighted support will help steady the footage and create movement that floats as opposed to shaking or juddering. More expensive devices include motorised gyroscopes that can counteract almost any movement and provide shake-free footage.

A rig may also contain a quick-release plate, and some rails on which other accessories such as focus pullers, clamps, lights, microphones, audio recorders, hard disk recorders and numerous other devices can be mounted. A cage may also be included, which is a frame that surrounds the camera on which various accessories

Tripods designed for video use are less prone to wobble than those for still-image photography



When shooting moving video, a shoulder rig (far right) or counterweighted stabilisation device such as a Steadicam (right) will help you produce shake-free footage

can be mounted. Cages often have a handle above the camera that allows it to be held steadily for low-angle handheld shots.

Cheap or expensive?

As with standard camera supports, there are hundreds, if not thousands, of different stabilisation and supporting options for shooting video and they come in a broad range of prices. Some can be fairly inexpensive, and do an excellent job, but there are other items,

such as a good fluid pan-and-tilt head, where it's better to buy the best you can afford. A good head should last a lifetime, while an inexpensive one may quickly frustrate you and may prove limiting as you become more experienced. We advise investing in a good-quality head upfront, as you'll almost inevitably end up doing away with the less expensive head anyway. Check www.thevideomode.com to see our latest reviews of video supports.

Video heads

At their core, video heads are much the same as standard photographic tripod heads. However, there are a few key refinements that help make it easier for videographers. The most important of these are smooth, fluid heads. The construction of such heads means that when panning horizontally or vertically (known as tilting), the pan has a smooth, even resistance. This enables the videographer to pan or tilt at a constant speed. Panning is controlled via an arm, and more expensive heads will provide a friction control that can change the level of resistance for when slower or faster pans are required. Some heads also offer the ability to lock the head so that it only moves across a particular axis, allowing the camera to be only panned or tilted.

Invest in a good-quality pan-and-tilt head from the beginning



Monopods can be used in a variety of situations and act as a stabilisation device when moving with the camera



Editing and exporting

The editing process is when your video really starts to take shape. We explain how to edit, export and share your video with the world

EVEN if you have been working on a short project that is just a few minutes long, you will probably have far more video than you actually need. The skill now is to make all the footage into a finished video.

Software

There are many different video-editing packages, and chances are you may already have one on your computer without even realising it. Windows may have Windows Movie Maker installed, but if it's not you can download it as part of the Windows Essentials package at <http://windows.microsoft.com/en-us/windows-live/download-windows-essentials#wetabs=we2012>. Those using a Mac may have Apple iMovie installed, but if not it is a reasonable £10.99 from the Apple App store.

Most software will operate in much the same way, allowing you to put the clips in sequential order, which is usually displayed as a timeline. You will also be able to edit the clips individually, choosing to trim or split them as appropriate. Trimming is the process

of changing the start and/or end point of a clip, in effect shortening it to cut out anything that isn't relevant. Splitting is the process of splitting a clip in two, often so that another clip can be slotted in where the clip is split.

The most popular software for editing is probably Adobe Premiere, which can be used on both Macs and PCs, and Apple Final Cut Pro X, which can only be used on Macs. Adobe Premiere is also available as Premiere Express in the form of a cut-down version of the software, although it should have everything you need when starting out without some of the more complex features of the full version.

Transitions

A transition is a device that is used to move from one clip to another. These can vary enormously, and most should be avoided or, at the very least, used in moderation. A simple cut from one piece of footage to another is usually enough, although transitions can be used to signify a change of scene, or a change of time and place. For example, a fade to

white can often be used before cutting to a dream sequence, while a fade to black may be used to signify the end of a day or the end of a particular sequence of footage. A cross-dissolve transition fades one scene out as another scene fades in, and when shooting the same subject it can be used as a smooth way to cut the footage without using a jump cut.

Have a play around with the transitions offered by your editing software. How you insert a transition will vary, but in general they are simply dragged and dropped into position between two clips on your editing timeline. The best advice when choosing transitions is to stick to the simple fades already discussed. Generally, most other transitions are very jarring and look unnatural. Watch films, documentaries and music videos to see how the filmmakers have cut between footage and used transitions. You will very quickly get a feel for the different circumstances in which each type is used.

Uploading to YouTube

YouTube YOUTUBE advises that video be uploaded in an MP4 container using the H.264 codec, with the same frame rate that was used for recording. Although other frame rates can be used, 24, 25, 30, 48, 50 and 60fps are all acceptable. Interlaced footage should also be de-interlaced and saved as progressive, although, as we recommend on page 7, it's better to use progressive footage in the first place to save this extra rendering process.

YouTube also offers the following guidance on bit rates:

Type	Video bit rate, standard frame rate (24, 25, 30)	Video bit rate, high frame rate (48, 50, 60)
2160 p (4k)	35-45 Mbps	53-68 Mbps
1440 p (2k)	16 Mbps	24 Mbps
1080 p	8 Mbps	12 Mbps
720 p	5 Mbps	7.5 Mbps
480 p	2.5 Mbps	4 Mbps
360 p	1 Mbps	1.5 Mbps



A cross-dissolve transition fades one clip out as another fades in, as illustrated here



Exporting

Once your footage has been edited, you need to save it all together in a format that you can use to play it. This is known as rendering or exporting, and how you render your video will depend on how you wish it to be used.

If you are rendering the video so it can be saved and played on a DVD, you will need a different set of export settings to those required if you plan to show it directly to a television. Similarly, exporting for the internet brings with it another few considerations.

Generally, the main considerations are the resolution, the type of compression and the bit rate. Each of these will have an impact on the size and quality of your video. It may sound very confusing and seem like a lot to consider, but once again, most software packages will have a complete set of presets designed to make it simple to export your video depending on your needs.

‘There are many video-editing packages, and chances are you may already have one on your computer’

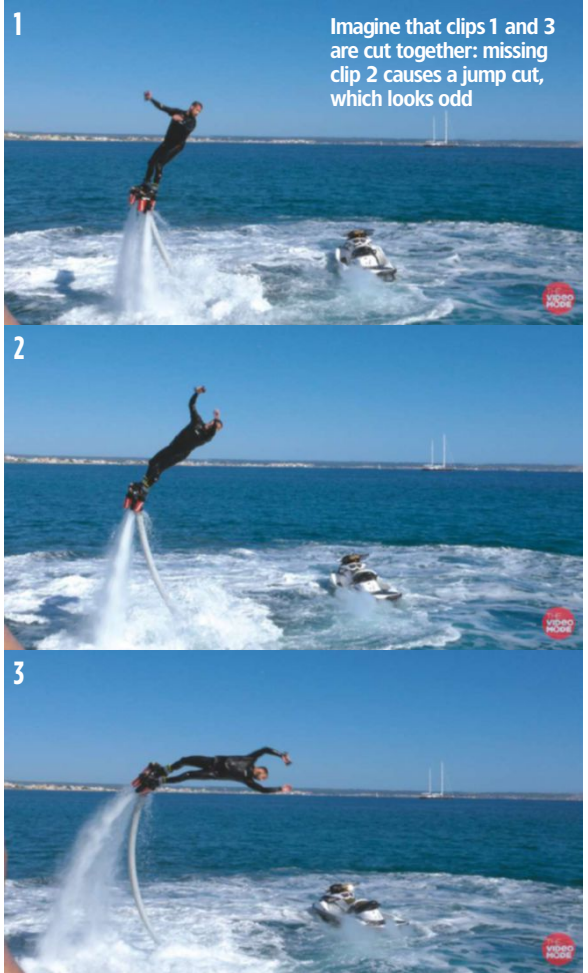


Bit rates

The bit rate is the amount of data that the video uses in one second. The higher the bit rate, the better quality the video, but the larger the file size and the more bandwidth and processing power will be needed to view it properly. Also, a higher bit rate will need a faster internet connection to view it in real time without buffering.

Using a codec that heavily compresses a video can reduce the bit rate, allowing it to load faster and play without interruption or dropped frames. However, as the codec does this by reducing the quality of the video footage, a compromise has to be made between size and quality.

Videos with variable bit rates are encoded so the scenes that require more detail have a higher bit rate than scenes that don't. See the *Uploading to YouTube* box (left) for more details on the specific bit rate required for YouTube, which should also be applicable for most online video sites.



Imagine that clips 1 and 3 are cut together: missing clip 2 causes a jump cut, which looks odd

Jump cuts

ONE THING to avoid is a jump cut. A jump cut is when two pieces of footage that have the same composition jump in time. Imagine having a 10-second video clip, but cutting 4 seconds out of the middle. Where the third second cuts to the eighth second, a jump cut is created. The effect can be very jarring and looks very odd.

However, filmmakers have also used jump cuts creatively, using maybe three or more jump cuts a few seconds after each other to show a quick passage of time or to create a very tense, uneasy feeling.

So, unless you have a deliberate purpose for using a jump cut, avoid it, but be on the look-out for films and television programmes that use them creatively and think of ways that they could be used to help the narrative of your videos.



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